

**PLASMA PROCESSING SYSTEM WITH
LOCALLY-EFFICIENT INDUCTIVE PLASMA COUPLING**

Abstract of the Disclosure:

5 An inductively coupled plasma source is provided with a peripheral ionization source for producing a high-density plasma in a vacuum chamber for semiconductor wafer coating or etching. The source includes a segmented configuration having high and low radiation segments and produces a generally ring-shaped array of energy concentrations in the plasma around the periphery of the chamber. Energy is coupled 10 from a segmented low inductance antenna through a dielectric window or array of windows and through a segmented shield or baffle. The antenna has concentrated conductor segments through which current flows in one or more small cross-section conductors to produce high magnetic fields that couple through the high-transparency shield segments into the chamber, while alternating distributed conductor segments, 15 formed of large cross-section conductor portions or diverging small conductor sections, permit magnetic fields to pass through or between the conductors and deliver only weak fields, which are aligned with opaque shield sections and couple insignificant energy to the plasma. The source provides spatial control of plasma energy distribution, which aids in control of the uniformity of plasma processing across the surface of the 20 semiconductor being processed.